



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,933	09/29/2003	Yuan-Hua Kao	Kao 4-23-15	1639
55169 7590 01/04/2008 BROSEMER, KOLEFAS & ASSOCIATES, LLC - (LUCENT) 1 BETHANY ROAD BUILDING 4 - SUITE # 58 HAZLET, NJ 07730			EXAMINER SINGH, DALZID E	
			ART UNIT 2613	PAPER NUMBER
			MAIL DATE 01/04/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/673,933

Applicant(s)

KAO ET AL.

Examiner

Dalzid Singh

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15 and 21-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15 and 21-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation of claim 30 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Art Unit: 2613

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 15-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 15 and 30 recites "data signals are synchronous" and "same data rates". The disclosure, as shown in Fig. 1, shows first modulator driven by DPSK data tributary and the second modulator driven by ASK data tributary. The DPSK and ASK data are shown to be independent of one another. There is no structure or diagram provided to show one of ordinary skill in the art how the data driving the modulators are synchronized and having the same data rates. Based on this the specification fails to provide enabling disclosure for claims 15 and 30.

Claim 30, recites "first modulator for amplitude shift keying (ASK) modulating an optical signal a first modulator for amplitude shift keying (ASK) modulating an optical signal in accordance with a first data signal to generate an ASK modulated optical signal; and a second modulator coupled to the first modulator for differential phase shift keying (DPSK) modulating the ASK modulated optical signal in accordance with a second data signal to generate a multilevel coded optical signal having a prescribed

extinction ratio..." The disclosure as shown in Fig. 1, shows first modulator (130) for modulating DPSK data and a second modulator (150) for modulating the DPSK modulated signal with ASK) data. The claim suggests reversal of the first and second modulator. There is no structure or circuit diagram provided to teach a person of ordinary skill how such reversal is provided. Based on this the specification fails to provide enabling disclosure for claim 30.

In view of the 112 rejection, it appears that claim 30 is intended to be similar to that of claim 15. Therefore, rejection of claim 30 will be grouped together with rejection of claim 15.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 15, 21-23, 26, 27, 29, 31-33, 36, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vrazel et al (US Pub. No. 2003/0198478) in view of Penninckx et al (US Patent No. 6,563,623).

Regarding claims 15 and 30 (in view of the 112 rejection), Vrazel et al disclose an optical transmission system, as shown in Fig. 4B, comprising:

Art Unit: 2613

a first modulator (475) for differential phase shift keying modulating an optical signal in accordance with a first data signal ( $D_2$ ) to generate a DPSK modulated optical signal; and

a second modulator (470) coupled to the first modulator and for amplitude shift keying (ASK) modulating the DPSK modulated optical signal in accordance with a second data signal ( $D_1$ ) to generate a multilevel coded optical signal (see paragraph [0030]) wherein the first and second data signals are synchronous and have the same data rate. using differential phase shift keying and amplitude shift keying modulation (as admitted by applicant *"synchronous data signals is well-known to a person of ordinary skill in the art. Moreover, a person of ordinary skill in the art would know how to synchronize two data signals or generate two data signals that are synchronous. In addition, it is common for two or more data signals to have the same data rate."* see page 5 of the remark).

Vrazel et al discloses transmission of optical signal by modulating the signal using Mach-Zehnder modulator and differ from the claimed invention in that the combination does not specifically disclose that the optical signal has a prescribe extinction ratio. Penninckx et al teach the use of Mach-Zehnder modulator which provide extinction ratio (see col. 5, lines 13-16 and col. 6, lines 3-10). Therefore it would have been obvious that the optical signal modulated by the Mach-Zehnder modulator of Vrazel et al has an extinction ratio.

Furthermore, Penninckx et al clearly suggest that that optical signal has prescribed extinction ratio. Based on this teaching, it would have been obvious to an artisan at the time of the invention to provide the extinction ratio to be within 5 to 10 dB. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to set the extinction ratio to be in the range of 5 to 10 dB.

Regarding claims 22 and 32, Vrazel et al do not disclose that the amplitude shift keying modulation generates chirped optical signals. However, it would have been obvious to an artisan of ordinary skill in the art to generate chirp optical signal using the Mach-Zehnder optical modulator by adjusting bias of to the modulator.

Regarding claims 21 and 31, the at least two modulators are modulators selected from the group consisting of a Mach-Zehnder modulator, a single-waveguide modulator, or an electro-absorption modulator (see paragraphs [0036, 0058-0060]).

Regarding claims 23 and 33, as shown in Fig. 4B, the transmitter comprise a differential encoder (precoder) means coupled to the modulator means.

Regarding claims 26 and 37, as shown in Fig. 5, Vrazel et al show DPSK receiver.

Regarding claims 27 and 36, as shown in Fig. 5, Vrazel et al show detecting the second data signal.

Regarding claims 29 and 39, as shown in Fig. 5, Vrazel et al show wherein the DPSK receiver includes a delay interferometer and a balanced detector.

6. Claims 25 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vrazel et al (US Pub. No. 2003/0198478) in view of Penninckx et al (US Patent No. 6,563,623) and further in view of Griffin (US Pub. No. 2004/0021829).

Regarding claims 25 and 35, the combination of Vrazel et al and Penninckz et al disclose the generation of multi-level optical signal and does not disclose that the optical signal is 4-ary. Griffin teaches generation of 4-ary optical signal (see Fig. 1 and paragraphs [0021 and 0022]). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to generate 4-ary optical signal. One of ordinary skill in the art would have been motivated to do such in order to increase transmission capacity.



Art Unit: 2613

7. Claims 24, 28, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vrazel et al (US Pub. No. 2003/0198478) in view of Penninckx et al (US Patent No. 6,563,623) and further in view of Liu et al (US Pub. No. 2004/0125435).

Regarding claims 28 and 38, the combination differs from the claimed invention in that the combination does not disclose post nonlinear-phase-shift compensation. Liu et al teach the use of nonlinear-phase-shift compensation (see Fig. 1). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide nonlinear-phase-shift compensation to the system of the combination. One of ordinary skill in art would have been motivated to do this in order to reduce nonlinear phase noise.

Regarding claims 24 and 34, the combination differs from the claimed invention in that the combination does not disclose providing pulse generation to allow for generation of RZ optical signals. Liu et al teach generation of RZ optical signals. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide RZ optical signals (see paragraph [0046]).

***Response to Arguments***

8. Applicant's arguments filed 24 October 2007 have been fully considered but they are not persuasive.

On page 7, applicant indicates that "The Examiner also concedes that Vrazel does not disclose DPSK/ASK modulation with an extinction ratio of between about 5 dB and about 10 dB, as recited in independent claims 15 and 30, as amended.

The claims do not recite such limitation. The independent claims 15 and 30 recites "multilevel coded optical signal having a prescribed extinction ratio between about 5 dB and about 10 db..." On page 5, lines 3-11, as originally filed, the specification discloses "Preferably, the intensity modulator 150 is driven to produce an extinction ratio (ER) of about 6 to 9 dB. The intensity modulator 150 can be a MZM, an electro-absorption modulator (EAM), or the like." This clearly states that the extinction ratio is produced by controlling Mach-Zehnder modulator (MZM). The prior art to Penninckx et al teach extinction ratio of optical signal provided by Mach-Zehnder modulator.

***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 30, 2007

**DALZID SINGH**  
**PRIMARY EXAMINER**

*Dalzip Singh*